VIII. ORGANISMS OTHER THAN PROTOZOA

Finally, we may mention that infections other than protozoal were occasionally encountered. Six cases showed worms' eggs in the faeces; four patients were thus infected with *Trichiuris trichiura* (L.) (= *Trichocephalus dispar*, Rudolphi), one with *Ascaris lumbricoides*, L., and one with *Ancylostoma duodenale*, Dubini. The organism described by Wenyon (1915) under the name 'I body' was found in five cases.

Our acknowledgments are due to Professor J. W. W. Stephens, Medical Officer in charge of the Tropical School Auxiliary Military Hospital, for his general interest in the work and for various helpful suggestions; to Professor Warrington Yorke, who has frequently given us the benefit of his experience in diagnosing difficult cases; and to Captain Llewellyn Morgan, R.A.M.C. (T.), who has facilitated our work at the Tropical School Hospital. We are also indebted to the sisters of this hospital for their willing co-operation in the daily collection of specimens. During the first few weeks of the period covered by this report we had the assistance, in carrying out the examinations, of Miss M. Pallis and Mr. W. Riddell, M.A., to whom we tender our thanks for their help.

NOTE.—While this paper was being prepared for the press, we had the privilege of seeing an advance copy of Mr. Clifford Dobell's report to the Medical Research Committee on examinations of dysenteric cases. On one important point treated in both his and our reports, we wish to make an observation. Mr. Dobell has laid stress upon the inadequacy of three examinations to detect a safe proportion of the cases of *E. histolytica*. We should like to state that in advocating three examinations as an *absolute minimum* we do not necessarily differ with Mr. Dobell who advocates six. We were aware of the desirability of more than three examinations, but thought it wise, since we know from practical experience that quite a considerable proportion of the patients obtain only one or two examinations, to advocate as a necessary first step toward improvement that each patient without exception should receive at least three examinations.

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BREINL.

NOTE ON THE 'ARNETH COUNT' IN HEALTHY ABORIGINAL CHILDREN OF NORTHERN AUSTRALIA

BY

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Previous work by us (1914) on Arneth counts of healthy white school children born and bred in North Queensland led to the interesting observation that the Arneth index showed a distinct increase when compared with that of normal individuals in Europe, being 74·5 as compared to 40·0.

In continuation of this investigation, opportunity was taken (1915) to estimate the Arneth index of natives—adults and children—of New Guinea.

The blood slides for this investigation were collected during a journey through the coastal districts of New Guinea, where yaws and malarial fever were endemic and more or less widely spread amongst the children examined.

The results showed that the Arneth index for adult natives corresponded closely to that of North Queensland school children of European descent, being 74·0, whereas that of the native children was considerably higher, namely 83·9.

A consideration of these figures led to the surmise that the greater shift in native New Guinea children resulted, in all probability, from the effects of active or latent malarial fever and yaws. Unfortunately none of the districts traversed were free from either of the two diseases, and it was therefore impossible to prove this surmise.

A visit to the Northern Territory of Australia afforded the desired opportunity. On Melville and Bathurst Islands, situated off the North Coast of Australia, forty children were seen, all of whom proved healthy on examination; their spleens were not enlarged, and in none of the blood slides taken could malarial parasites be discovered, nor was there any evidence of yaws amongst them.

Arneth counts were therefore performed on these slides. The same technique was employed as in our previous work. Two sets of a hundred consecutive leucocytes were enumerated, and only counts considered where the two sets of figures agreed closely.

Table I contains the averages obtained for Arneth and differential counts of these children, and, for comparison, the corresponding figures for North Queensland school children and for natives of New Guinea, adults and children. There is a close agreement between the figures of the first three groups, whereas those for the native New Guinea children show the deviation from the European standard still more marked. This close agreement strengthens our conception that the alteration of the blood picture in North Queensland school children can be regarded as an outcome of climatic influences only.

Scott Macfie (1915) believes that 'it is probable that the abortive inoculations with malaria parasites . . . are sufficient to account for this shift in apparently healthy Europeans, without postulating the specific action of the climate on the white races living in the tropics.' He suggests, further, that 'the changes observed in the Arneth counts are due to toxaemia causing a destruction of the circulating polymorphonuclear leucocytes and a flooding of the blood with young cells liberated by the activity of the leucopoetic system.'

It is feasible that the changed Arneth picture in malarial fever can be accounted for by the reaction of the organism, and especially the blood-forming organs, to the parasitic invasion.

In the blood of the North Queensland school children and the native children of Bathurst and Melville Islands there is a distinct increase in the Arneth index. In both localities malarial fever and other parasitic infections can be excluded, and some cause, other than disease, must be sought for. The further increase in the case of the native New Guinea children, living in endemic areas, may be accounted for by infection.

We believe that the results of the Arneth counts of Northern

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TABLE I

	Number	Arneth Classification per cent. I	II	III	IV	V	Arneth Index	Differential Counts per cent. Poly-morphonuclear neutrophile	Transitionals	Large Mononuclear	Lymphocytes	Eosinophiles	Mast cells
Northern Territory Children	30	25·8	45·8	23·3	4·8	[illegible]	[illegible]	52·3	[illegible]	[illegible]	33·0	[illegible]	[illegible]
North Queensland School Children (white)	150	32·5	42·0	20·6	4·5	[illegible]	74·5	50·1	4·2	[illegible]	[illegible]	[illegible]	[illegible]
New Guinea Adult Natives...	104	30·04	44·0	21·23	4·3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11·07	[illegible]
New Guinea Native Children	[illegible]	42·96	40·0	13·8	2·13	[illegible]	85·80	[illegible]	2·47	[illegible]	42·80	13·24	[illegible]
Normal Europeans*	[illegible]	[illegible]	35·0	41·0	17·0	[illegible]	[illegible]	[illegible]	[illegible]	0·8	[illegible]	2·4	[illegible]

* Arneth

† Ehrlich, Lazarus

Australian native children, living in a healthy district, form a link in the proof that climatic conditions in the tropics as such can be held responsible for the altered blood conditions of inhabitants of the tropics, and that it is not necessary to resort to endemic disease as an explanatory factor.

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